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Synthesis, structural and optical properties of silver nanoparticles uniformly decorated ZnO nanowires

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Abstract: Silver (Ag) nanoparticles decorated Zinc oxide (A-ZnO) nanowires have been successfully synthesized by two-step chemical vapour deposition and magnetron sputtering method. The X-ray diffraction patterns revealed their hexagonal wurtzite structure. SEM images indicated the Ag nanoparticles are distributed uniformly on the surface of A-ZnO nanowires. By extending the sputtering time, the atomic percent of Ag increased gradually. Moreover, the photoluminescence results demonstrated two major emission peaks for the A-ZnO nanowires. Where, the visible emission peaks were stronger than those of unmodified ZnO nanowires. These studies promise their potential applications in multifunctional optical devices.

Keywords: Zinc oxide; Photoluminescence; Magnetron sputtering; Chemical vapour deposition; Optical materials and properties

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